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Sustainable Use for Global, National and Community Benefit: An Analysis of Utilisation and Biodiversity Conservation

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POLICY RECOMMENDATIONS

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Abstract

This document summarises the policies required for the implementation of sustainable wildlife use. It is based upon a series of case studies conducted for the purpose of analysing the meaning of sustainable use discussed at length in the Technical Report on Sustainable Utilisation. These case studies are summarised here for the purpose of illustrating the basic principles of a sustainable use regime. The conclusion states that there is a need for a certification mechanism that certifies sustainability and engenders exclusive purchasing arrangements between certified producers and conservation-minded consumers. It is recommended that this mechanism be created at the multilateral level in order to induce the substantial investments required for its success and in order to make exclusive purchasing a legal obligation.

Policies for Implementing Sustainable Wildlife Utilisation

Introduction

Biodiversity is under threat from a number of distinct sources: over-exploitation, introduction of exotic species, habitat conversion and environmental pollution. At base, however, the problem of loss of biodiversity lies with the developmental process and the pressures that this places for social change and consequently land use and general environmental change. Species have adapted to one set of conditions and humans are reshaping the environment in ways that upset this equilibrium. Out of such conflicts come projections of global change and possible mass extinctions.

The use of wildlife must be seen within the context of this fundamental conflict between human development and the conservation of biological diversity. All of the values of wildlife must be recognised and realised if it is to find its rightful position in relation to human development. This study focuses primarily on the use values of widlife . The non-use values may be equally large or, in some cases, greater, but they are difficult to quantify and mechanisms for capturing them are poorly developed. Until they have been, use values will form the bulk of market values of wildlife. The sad fact is that the future of all wildlife is now an economic question, simply because economics is defined as the study of the human allocation of resources between competing objectives. Species now have their future determined by decisions on resource allocation made by human societies, if not directly, then concerning the conservation of a habitat or its protection from pollution. Human societies have many competing objectives (health, education, recreation) and wildlife will have to compete with these for its allocation of resources. It will be the aggregate value of wildlife that will ultimately determine its allocation of resources, and hence its continued existence.

This document outlines the conditions that are required to channel wildlife values, and especially use values, into constructive forces. This is a difficult task, as the history of wildlife use attests; however, there is no alternative. In this document, the basic principles of sustainable use are outlined in the context of several case studies. These principles demonstrate that sustainable use requires that local communities (i.e. those living with the wildlife and its habitat) be given incentives to retain that habitat in the uses that are compati ble with its wildlife. Otherwise local communities will almost always find another more valuable use of the land which is often incompatible with its resident species. Therefore the first principle of sustainable utilisation must always be focused upon local communities and their incentives for maintaining wildlife and its habitat. This is the case irrespective of the legal status or designation of the habitat and its wildlife; local communities will always make the most fundamental decisions regarding the retention of wildlife irrespective of its official status.

This does not mean that there is not an important role for government regulation regarding wildlife. Governments must undertake far more complex wildlife utilisation policies than they have in the past. Effective domestic policies will both provide incentives for the maintenance of wildlife species and also regulate the quantity and the quality of any resulting use. Wildlife habitat will always be of the nature of a "commons", and this means that some sort of regulatory control wil l be beneficial to control the intensity of use in order to avoid inefficient degradation and to aid in the appropriation of the full value of the wildlife.

A very important governmental role in the control of wildlife utilisation will often exist at the international level. This is because the major consuming countries for most wildlife products (in

terms of monetary value) exist in the "North" while the major producing countries exist in the "South". If the value of wildlife is to be used for the preservation of its habitat, this means the capture of value in the North for application in the South. This international interface already exists at both commercial (trade) and organisational (wildlife and conservation) levels. The problem is that these interfaces need to be organised and directed to the same purpose as the domestic regulator, i.e. the regulation of the intensity of use and the capture of rents. The international governmental role is the creation of a mechanism that will serve as the foundation upon which domestic governmental regulation may be developed and through which the values of wildlife may be channeled.

These principles point to the importance of the development of a *sustainable use certification mechanism.* The purpose of such a mechanism is to enable the transfer of values existing in the Northern states to local communities living with wildlife in the Southern states. These values will be maximised when Northerners believe that they are also supporting habitat conservation when they are purchasing wildlife products. The role of an international certification mechanism is to ensure that the values transferred from North to South for wildlife products are applied to habitat conservation, thus ensuring that the maximum price is paid for the individual product. In this way the commercial interface in the wildlife trade becomes the mechanism by which the North is able to express its preferences regarding land uses in the South while simultaneously providing the incentives for local communities to live with wildlife.

This mechanism should be developed at the multilateral level. This is important for the purpose of coordinating production across Southern countries as well as within them. It also reduces the incentives for some consumers to free ride upon the efforts of others. Creating the certification mechanism at the multilateral level makes its recognition and enforcement a legal obligation for domestic governments. Finally it is important for a single international regulatory regime to be implemented in this field precisely because of the multiplicity of regulatory efforts that already exist at the international level. There are innumerous international organisations, governmental and nongovernmental, working at similar and cross-purposes on these issues. However, the fundamental problem in biodiversity conservation is the need to create a mechanism through which values in the North favouring habitat and wildlife conservation may be transferred to the South. The wildlife trade itself may be put to this purpose by means of certifying when its value is being channeled back into habitat and wildlife conservation. The implementation of an effective and efficient international certification mechanism would be sufficient to supplant many of the efforts already being undertaken in this field. For this reason our final recommendation is that the wildlife use system be built upon the foundation of a multilateral regime for certifying sustainable producers of wildlife products.

A. The Need for the Development of Wildlife Resources

1. Local communities make the decisions on land uses that will determine the natural resources with which they live.

2. Successful wildlife conservation policies are necessarily based in the sustainable development of local communities down pathways that are compatible with the resources with which they live.

3. Policies based on the prohibition of all use are unlikely to provide for the long term viability of a species.

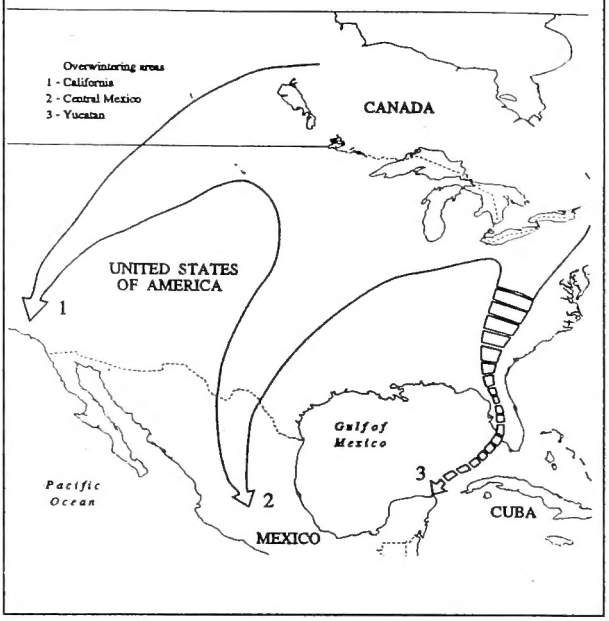
The case study of the different Monarch Butterfly reserves illustrates the first two points. In each case, the reserve was primarily designated to conserve the butterfly (as it was a critical habitat for the species), and the government had enacted a prohibition on alternative uses of the habitat that conflicted with this objective. Despite this prohibition, in all but one of these reserves, substantial use of the forest resources occurred, primarily timber extraction for commercial and subsistence use by local communities. The one exception occurred in the monarch butterfly reserve that had developed a substantial tourism-based economy around it. In this instance, the local community had come to view the reserve as an asset on which its development relied. Here, the local community's incentives were compatible with the national government's prohibition and, for that reason alone, the prohibition on alternative uses was effective.

The third point is suggested by the case study of the *Vicuña* (summarised below in section E), which had been harvested almost to extinction, prior to the introduction of a prohibition on its use. Initially this prohibition met with success, the population soared severalfold, in response to conservation measures until it neared the carrying capacity. At this point, poaching increased and the population began to fall once more. An additional problem was that the *vicuña* is in competition with other domesticated livestock (llamas and alpacas) over its range. While the *vicuña* could not be harvested legally, it had zero use value for the local communities and, indeed, carried a significant opportunity cost as a competitor for grazing. In the long term it is unlikely that the local communities would have continued to tolerate these levels of competition.

A. Conservation and development in the Monarch Butterfly Special Biosphere Reserve.

The monarch butterfly, *Danaus plexippus*, undertakes one of the most outstanding examples of animal migration, described as ``a unique biological phenomenon". Each winter, hundreds of millions of monarchs coalesce from a continent-wide distribution in North America to overwinter at as many as 129 colonies in California and approximately 10 small sites in central Mexico that range in area from 0.03 to 3.34 hectares of oyamel fir forest (see Map 1).

Map 1. Migratory routes of the Monarch butterfly



Despite the fact that the monarch butterfly is a common species, its migration to tightly aggregated overwintering sites makes this phase of its life history especially vulnerable. Hence, the conservation of these overwintering aggregations and their habitat is crucial. The fact that the monarch remains for up to 5 months in these heavily packed aggregations poses considerable problems for their conservation, particularly in Mexico, where socioeconomic pressures for land use are greatest.

In California, the Xerces society secured funding for the Monarch Project in 1984 and started negotiating protective easements and landowner registrations. Unlike California, Mexico's overwintering sites are mostly located in communal and "ejido" land under community management, and the creation of private reserves is not feasible for most sites. In fact, only a fraction of one of the five biosphere reserves (Chincua) created to protect the monarch was bought from a private land owner.

The oyamel fir forest, used exclusively by the monarch, has been exploited both for commercial and subsistence use in Mexico to a point that only 40,000-50,000 ha are thought to be left. Monarch colonies tend to aggregate in the higher and dense fir-dominated forest. This association is the main source of limitation on forestry activities in the region. There is, however, much controversy over which particular forest densities the butterflies select. Some studies have suggested that monarchs prefer moderately disturbed forests, leading to the belief that controlled forest management is a feasible conservation option and this is currently being developed in one of the reserves.

The Monarch Butterfly was declared protected in 1980, but it was not until 1986 that the Monarch Butterfly Special Biosphere Reserve (MBSBR) was formed by decree and its boundaries established. In total, the reserve covers some 16,110 ha in the Mexican states of Mexico and Michoacan. The five areas constituting the reserve (Sierra El Campanario, Chivati-Huacal, Altamirano, Cerro Pelon and Sierra Chincua) differ significantly in size and degree of restrictions. The creation of the MBSBR directly affected 37 ejidos, 11 communities and 5 small private properties.

Table 1. Number of visitors (national and foreigners), total income and entrance fee to the El Campanario Sanctuary during the seasons 1984-94

Season	Visitors			Gross Income
	National	Foreigners	Total	'000 N\$
1984-85			7,500	
1985-86				
1986-87			30,000	
1987-88	37,192	1,508	41,644	50
1988-89			44,172	98
1989-90 \1			70,000	325
1990-91	61,822	8,179	70,000	301
1991-92	55,136	3,896	59,032	506
1992-93	56,612	2,278	58,890	438
1993-94	53,801	2,120	57,321	429

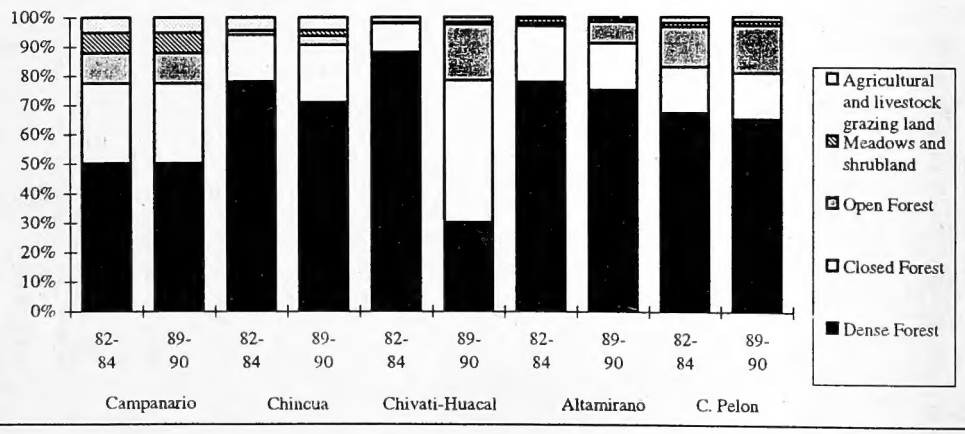
\1 Estimate produced by SEDUE.

Source: INE, 1992, SEDESOL 1994.

As a means of involving the local community and to help alleviate the negative impacts of the restrictions on logging, a local NGO, Monarca AC, and the government have encouraged the development of tourism in one site open to the public (Cerro El Campanario). The promotion activities and the media rapidly increased the popularity of the site, from some 7,500 visitors in 1984, to a peak 70,000 in 1990 before declining to about 57,000 in 1993. The majority are national visitors who come from Mexico City, whereas most foreign tourism comes from the United States (Table 1) .

As a result of socioeconomic pressures, illegal logging has increased in most areas. An illegal network of intermediaries is still in operation, particularly in areas where the forest is not managed by the community. Analysis of deforestation in the five reserve areas between 1982 and 1990 shows significant differences among the various areas of the reserves. The least altered was El Campanario, where there is a local tourism industry, indicating that tourism has managed to curb land use conversion. The government's designation of monarch reserves has had little impact on areas other than this one (see Figure 1).

Figure 1. Changes in land use patterns in the five polygons of the reserve between 1982/84 and 1989/90. Taken from SARH 1992.



B. The Need for Managed Development of Wildlife Resources

1. Use of wildlife is not, in itself, sufficient to establish incentives for its conservation - management is required for use to generate these.

2. Governmental intervention in wildlife use should be directed to the creation of rents (restricted output) and the reduction of the costs of joint management (increased monitoring).

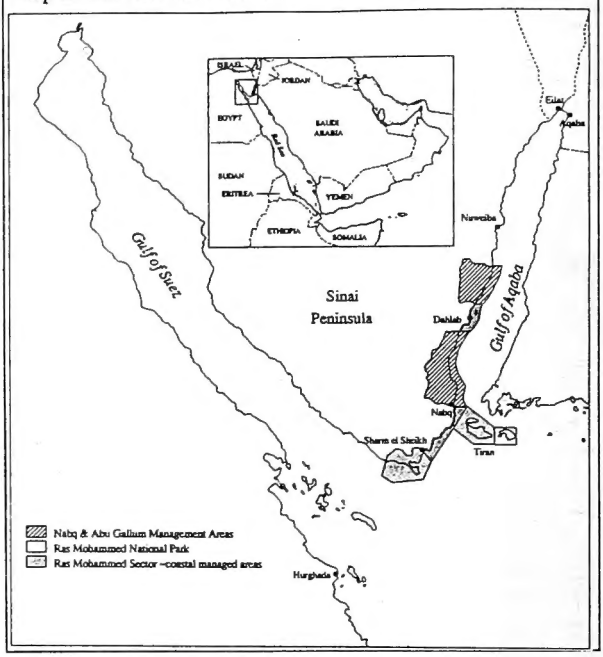
3. Rent appropriation is important because it creates incentives to invest in the resource. Monitoring is important because it reduces the incentives to over-exploit the resource.

These points are best illustrated by the Red Sea Coral Reef case study of two tourism development sites. One, Hurghada, made use of its coral reef resource in an unrestricted fashion, where the government allowed unmanaged development of the shores along the reef. The other, Sharm, made use of its coral reef in a managed fashion, where the government restricted development density along the reef (tourism and fishing) and implemented a monitoring programme for compliance. The contrasting results were dramatic. In Hurghada, development density is nearly three times greater and the reef suffers from over-exploitation (three times as many visitors and twice as many boats), reckless exploitation (unnecessary damage from construction of hotels and unmanaged tours) and pollution (poor visibility). In Sharm, the restricted number of operators has rendered it possible for them to recognise their interdependence in their joint use of the reef, and thus they have invested in its conservation. The hoteliers in Sharm provide more mooring sites and diver briefings to spread impacts and reduce unnecessary damage. They have also invested in sewage controls and visibility is ten to twenty times greater than at Hurghada. Importantly, all of these investments earn a return. Hoteliers at Sharm are able to charge a fee double that applicable at Hurghada. It is this price differential between the controlled and the uncontrolled resource use that is the *rent* flowing from the resource. It is only through governmental restriction of use of the resource (and monitoring to ensure compliance with the restriction) that rents are created, and hence incentives to invest in the reef are induced.

B. Sustainable Tourism in Ras Mohammed National Park, Egypt.

The Sinai peninsula, located at the northern-most part of the Red Sea, is embraced by the Gulf of Suez to the west and Aqaba to the east (Map 2). The Gulf of Aqaba is bordered by a luxuriant fringing reef which extends along almost the whole 200 km shoreline from Eilat (Israel) in the north to Ras Mohammed (Egypt), the southernmost tip of the peninsula, interrupted only by shallow bays.

Map 2. The Ras Mohammed National Park and Hurghada.



The reefs of the Gulf of Aqaba are subject to few natural disturbances. The Red Sea is a narrow and almost enclosed body of water with generally small waves and very rare storms; the lack of river runoff, low planktonic primary production and extremely low rainfall result in very clear water. These features have all contributed to the biological uniqueness of the area; a relatively high diversity of corals and over one thousand species of fish living in transparent, warm waters have formed the basis for the region's popularity as a tourist destination.

The vicinity of Sinai's reefs to the European tourism market and Egypt's economic needs have led to an unprecedented increase in tourism and associated infrastructure. In 1983 the Government of the Arab Republic of Egypt declared the Ras Mohammed peninsula, a 'Marine Protected Area', in order to protect the coral reef and its tourism potential. Technical assistance from the EU supported an initial development phase. This first phase, lasting two and half years, demonstrated, among other things, that strict management of marine resources did not need to hinder development in South Sinai. One of the objectives of the management in place at Ras Mohammed was to show that all development in the area was resource dependent and that the degradation of coral reefs and other marine ecosystems would limit the area's economic potential, a message that has since been recognized by the private investors in the region.

Despite the fact that since 1988 the number of hotels in South Sinai has increased from 5 to 36 and the number of diving centres from 5 to 26 in response to the higher demand, many of the usual negative consequences of tourism development have been avoided at Ras Mohamed. Some of the more common effects, such as siltation due to construction, waste water discharge, damage from collecting, fish feeding, over-fishing, anchoring and diver damage are, for the most part, absent in the Ras Mohammed National Park Management Sector.

Measures to minimize the negative impacts of tourist on reefs (e.g. environmental education, walkways, sewage systems, moorings) have been deployed in the RMNP, some of them state-funded, but an increasing proportion have resulted from private investment (see Table 2), after realizing the benefits of conservation. Some hotel managers indicated that lack of diving intensity limitations would increase their revenue by 10-15% per year but only for two-three years at most. Indeed. a niche in specialized tourism has been created and operators are keen to maintain it.

From a survey, the majority of visitors rated the Ras Mohammed Sector reefs and associated marine life very highly. More than 50% of visitors surveyed rated the South Sinai reefs better than other destinations when describing corals, fish life and visibility, respectively. This clearly shows the benefits of management and controlled development.

The mechanisms in place at Ras Mohammed, however, are by no means standard in the region and the effects of unregulated tourism can be seen in other reefs in continental Egypt, such as Hurghada. The resort of Hurghada was established nearly 30 years ago and rapidly became a tourist destination for Europeans. The less controlled development led to massive hotel development between the coastal road and the shoreline and, in particular, on the back reef itself. Developed under lax regulations, Hurghada represents an example of resultant environmental collapse and loss of an economic resource. Use levels of the reef are much higher than in Sharm, dive packages selling for up to 50% less than in Sinai and providing a lower quality service. Boats are having to take their customers further south along the Egyptian mainland in search of less degraded reefs. Table 2 presents the sharp contrast between the quantity and quality of development between Sharm and Hurghada.

Table 2. Some key parameters at Sharm el Sheikh and Hurghada. Most data from RAS MOHAMMED NATIONAL PARK (SHARM) and Fawzi (1995), HEPCA and Medio (pers. obs.).

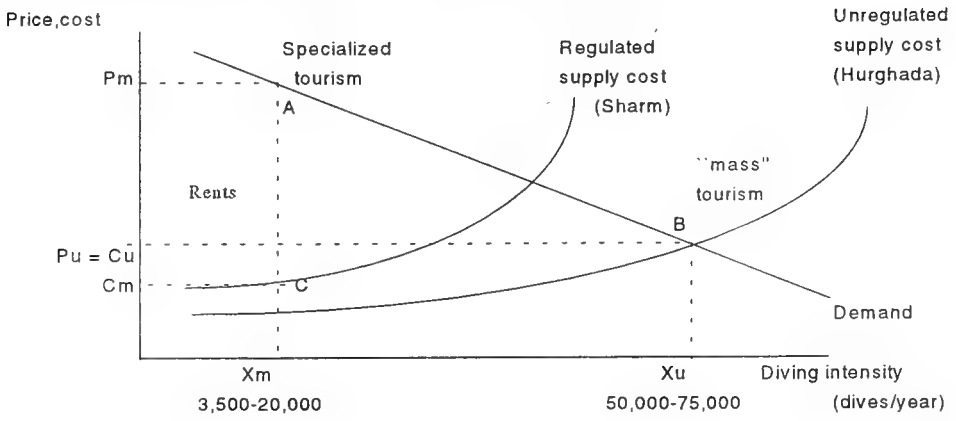
	Sharm	Hurghada
Government Intervention		
Urban planning	yes	no
Monitoring programme	yes	no
Public awareness prog.	yes	no
Fishing regulations	yes	no
Development density indicators		
Hotels	40	127
Dive centres	27	85
Boats	220	400
Investment for conservation		
Dive sites	37	30
Fixed moorings	108	65
Diver briefing (% dive centres)	65	3-5
Conservation benefits		
Sewage pollution	no	yes
Infilling	1/40	64/75
Underwater visibility (m)	15-30	1-2
Anchor damage	neglig.	signif.
Rents from conservation		
Avg. price of package	US$45	US$27

Successful management at Sharm has so far prevented the resort from following the same course of development as Hurghada. From an economic point of view, the rents to resource `appropriators', i.e. the tourism industry, created through restricted output, have to be maintained to encourage resource investment (management costs). In Hurghada, rents appear to have been almost dissipated and the open access to the reef has eroded all incentives for individual firms to protect it.

This situation is illustrated in Figure 2. While Sharm caters for specialised tourism, Hurghada pursues a mass tourism strategy offering a lower natural quality. The significant difference in package prices indicates the extent of rent dissipation in Hurghada, with Sharm operators capturing rents in the area P_m -A-C-C_m in Figure 2, while rents in Hurghada are dissipated ($C_u = P_u$).

Quantitative and qualitative supply restrictions appear to be critical for the maintenance of appropriate rent levels. Current management at Sharm addresses both by limiting the number of boats per site, passengers per boat, number of diving sites (quantitative), while also providing environmental awareness talks to the visitors, requiring appropriate sewage systems and infrastructure designs to minimise damage per visitor (qualitative). These findings stress the need for regulation to complement and, direct market forces to generate conservation.

Figure 2. The regulated (Sharm) versus unregulated (Hurghada) tourism.



Notes: By controlling and restricting the access to the reefs, operators in Sharm are able to maintain prices (Pm) above costs (Cm) and earn a positive rent from the resource at the regulated level of diving intensity (Xm), represented by the shaded area. In contrast, the lack of control allowed the significant expansion of the industry, to a point that tourism related damage reduced the quality of the reef. Moreover, operator costs are increasing as a result if the search for better reefs and they are forced to lower prices to maintain their share in the market. As a result, rents from the resource have been eroded and operators charge prices (Pu) equal to their cost (Cu) at the unregulated level of diving intensity (Xu).

The fast future growth expected in Sharm will have to be counterbalanced by maintaining current incentives to protect the reef at the tour operator level. This will not only depend on the enforcement capacity of the management authority, but also on the continued existence of positive rents to be gained from conservation investments.

C. The Respective Roles of Individuals, States and International Institutions in the Management of Wildlife

1. There are distinct roles for several different levels of wildlife management: individuals and local communities, states and international institutions.

2. Financial incentives will induce individuals to manage wildlife resources in the social interest, with two provisos: a) they must be made to perceive the full social cost and/or value of the impacts of their decisions with regard to the resources they are managing; and b) they must be made to perceive the value of cooperating with others in their community with regard to the resource.

3. The role of the state is to correct individual incentives where they conflict with the social good, and to maximise rents from the use of the resource. This means that states should: a) internalise costs external to the individual's decision making framework; b) aid individuals in contracting between each other for this purpose; and c) implement policies that manage aggregate production from the resource.

4. The role of international institutions is to aid states in accomplishing their objectives, when certain of their problems transcend national boundaries. This means that international institutions should: a) internalise values of wildlife that exist beyond state boundaries; and b) aid states in implementing their rent appropriation policies.

These points are best illustrated within the context of the Southern African Conservancy Case Study. In Namibia in 1967 the state took wildlife management in a new direction by devolving management of all wildlife on private property to the individual landholder. Despite fears of uncontrolled harvesting of wildlife, the opposite has been the case. The number of species on Namibian private lands has increased several fold, and the total biomass of wildlife has doubled over this period. The financial incentives to use wildlife resources are substantially greater than to use domesticated livestock over much of the arid range of southern Africa, and individual landholders are acting in recognition of these incentives.

The state retains important management roles in regard to the wildlife resource, even when individuals are given a recognised or primary management role. First, the individuals only respond to the financial incentives to invest in wildlife, not the socially correct ones; this indicates that the state has a role in *internalising external costs*. For example, the landowners in Namibia are not only re-introducing the wildlife species once eradicated by active government livestock programmes, they are also introducing exotic species demanded by big game hunters. These exotics have potentially large ecological cost, and it is the government's role to make certain that the individuals bear this cost when making this decision.

Secondly, there are many other externalities of wildlife management which individuals may be able to internalise through joint management with one another. This has occurred in southern Africa through the emergence of the conservancy movement, whereby neighours join together to manage their property for wildlife conservation. This has resulted in the removal of interior fences and joint investment in the provision of water and the re-stocking of wildlife species, investments that would

have been impossible in the absence of cooperation to increase the scale of the operation. The role of the state here has been to aid these individuals in the enforcement of their contracts. The conservancies depend for their success upon the monitoring of individual use of the joint assets. Namibia provides this monitoring by means of the requirement of a state-licensed guide with each hunting party and the requirement for annual state-monitored wildlife censuses. These *auditing* roles of the state increase the efficiency of wildlife management based on individual incentives.

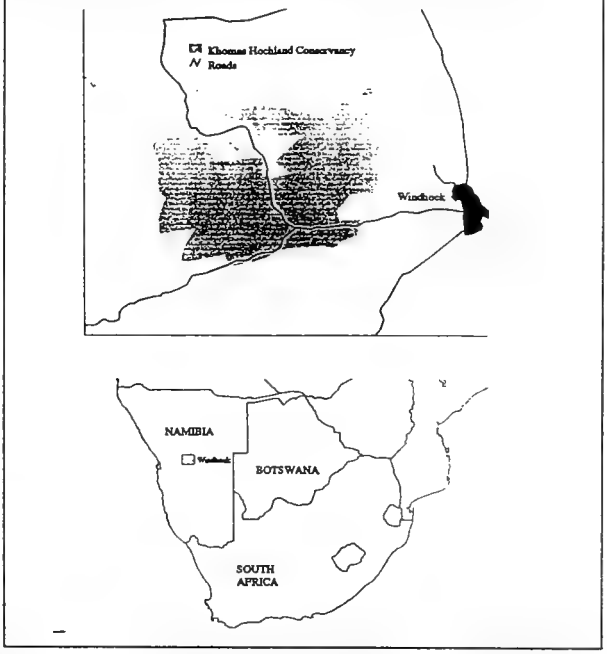
Thirdly, as indicated in the Coral Reef case study, the ultimate objective of the state in wildlife management must be the inducement of individual investments by means of restrictions on aggregate harvesting. Overuse, even in the aggregate, drives down the prices for everyone, and restricts the availability of rents. The state should always look to restrict entry to the market in order to maintain high prices and rent-induced investments.

These points indicate the nature of the role of an international institution as well. There are certain of the above roles of a state which extend beyond its borders, and hence cannot be managed by one state alone. The southern African wildlife case study provides a good example, where the focus is on those uses which produce the greatest **appropriable** value. These tend to be uses for which travel to those countries is a requirement, i.e. tourism and sport hunting. There are other values of wildlife which do not involve travel to the host state, and these are less easily appropriated by the host state in the absence of international cooperation. For example, a pilot study in the U.K. indicated that the average person might be willing to contribute £10 for programmes to ensure the conservation of the black rhinoceros, an exclusively southern African species. It is one of the roles of an international institution to enable the host state to appropriate such transnational values so that they may be applied to conservation there.

An international institution may also assist in the pursuit of other objectives of the host state, such as the monitoring and enforcement of rent-creation policies. Whenever the producers of a wildlife resource are in one country and the primary consumers are in another, international cooperation will be required in order to implement any sort of policy directed to rent maximisation. For example, producer states might need to implement an aggregate quota on production, and consumer states could assist by monitoring imports and restricting them to designated quantities and suppliers.

C. Conflicts in Wildlife Conservation-The Role of Property Rights: the Southern African Conservancies

Map 3. Tne Khomas Hochland Conservancy, Namibia



The southern African conservancy movement originated initially in the legislation passed in 1967 by the South West African (now Namibian) assembly by giving "the owner and occupier of a farm full ownership of all game, other than specially protected and protected game, while such game is lawfully upon such farm and while such farm is enclosed with a sufficient fence." It was this "privatisation" approach to wildlife that generated an entirely different management system for the wild animals in what is now Namibia. Subsequently, nearly identical legislation was adopted in Zimbabwe, extending these rights of ownership to commercial farmers and then to communal areas in 1982.

Once private property rights in game species were in place, the individual landowner had the capacity to capture the use values of wildlife on his land. The immediate problem facing these individuals was that in many cases the individual landholdings were insufficient to support the range of the wildlife species. Much of the Namibian territory is extremely arid and wildlife must range across large territories in order to browse successfully and to locate water supplies. Although individual ranches are usually very large (c. 5-10,000 ha), the individual range of many of the wildlife species in these arid districts is often even larger.

The solution to such problems has come with the establishment of a contractual relationship between neighbouring landowners providing for the joint management of the wildlife species that range across their lands. In such agreements, between ten and twenty landowners join together to establish a common outside boundary around a more substantial land area, and principles for the joint management and use of the wildlife. In Namibia there are at present four conservancies: Ngarangombe (100,000 ha), Waterberg (150,000 ha), Khomas Hochland (130,000 ha) and Black Nossob (130,000 ha). Each of these conservancies has been registered with the Namibian Ministry of Environment, and has agreed to certain regulations governing its registration; such a registration is necessary in order for the landowners to have their land designated for joint management.

The conservancy concept constitutes a solid groundwork for the joint management of game species by both getting the individual users involved in the development of the control policy and by having an outside presence involved in the implementation of that policy. The former element is important in making the policy acceptable, and thus enforceable at least cost. The latter element is essential for providing the assurance that all parties are complying with the agreement, removing the incentive to free-ride on the others' compliance.

The key to this programme is the values that these species generate, and the benefit sharing system that has been implemented. Each hunter must pay a trophy fee for any animal bagged on the conservancy property as well as for lodging and a licensed guide. The hunter is recruited from Europe or the U.S. and his lodging fee is kept by the landowner who recruits and lodges him. However, once the hunter is within the conservancy, the individual conservancy member is welcome to hunt on any of the conservancy property. The landowner on whose property the game is bagged is entitled to a specified share of the trophy fee, and the conservancy itself receives a further 5% of this specified fee; the recruiter conservancy member is entitled to the rest of the trophy fee as well as the lodging fee.

This benefit sharing arrangement allows for the various landholders to share in the benefits of game ownership, even if they do not themselves engage in recruiting and lodging trophy hunters. All that is required is that they participate in the joint management actions that enable the use of their land by game species. In addition, the levy collected by the conservancy itself is used to fund jointly beneficial management activities, including restocking of game species and the construction of exterior game-proof fences.

Namibian Regulation of the Conservancy Movement

The state regulations that affect the members of a Namibian conservancy:
- the conservancy must have a common boundary within which all landowners are members
- the conservancy must have a secure external fence marking its boundary
- the conservancy must have a constitution governing its objectives and a standing committee responsible to the state for meeting those objectives
- the conservancy must provide for rules concerning management and use (benefit sharing)
- management rules must provide for ongoing monitoring of specified characteristics of the game species (e.g. populations, trophy sizes, sex ratios) and it must allow the state to participate in that monitoring
- the conservancy must provide a state-licensed guide on each trophy hunt

Therefore, as a direct result of the financial incentives inherent in the privatisation of wildlife within Namibia, private landowners are in the process of removing fences erected earlier this century and re-stocking species that were eradicated in the process of these earlier conversions. In addition, it is clear that these are only the first steps down the road toward wildlife-based land uses. Conservancies continue to look for members and are in the process of importing other wildlife (giraffe, impala) in the hopes of developing the ecotourism-based values of its lands as well.

Joint Management Actions of the Khomas Hochland Conservancy

The joint management actions taken by the Khomas Hochland conservancy since its initiation in September 1992, have included:

- the reduction of the cattle stocking levels on the conservancy lands;
- the opening of waterholes to game during the dry season;
- the removal of two wire strands from the interior fences;
- the erection of game proof fences on some of the exterior boundary;
- the stocking of new wildlife species (hartebeest);
- the development of common marketing organisation (brochure, agent).

The analysis of economic returns from alternative land use models at various scales of operation offers important insights into the economic forces at work. First, there is a positive financial return to game ranching on Namibian land, even at the individual landowner level; however, it is apparent that this is not a socially beneficial use of capital as the rates of return are relatively low for this economy (i.e. in the region of 4-5%). The economies of scale realisable when several landowners work together in the provision of wildlife services changes this picture quite dramatically. At the scale of most existing conservancies (i.e. c. 100,000 ha.) the rates of return increase to economically competitive levels (i.e. 8-10%). This is the incentive for the creation of these large landholdings under joint management. Even more importantly, when the real social costs of the factors used in these operations are evaluated (rather than the prices actually paid) the rates of return to a conservancy escalate to a very impressive level (i.e. 13-20%). These studies provide a picture of privatisation-led land use determinations (through fiscal incentives) that are generating substantial value for the society as a whole.

Governmental Interventions - Land Use Conflicts

Interventions Required for Market Determined Optimal Land Uses:
- Remove distortions in market prices of factors used and products produced in alternative land uses (agricultural subsidies, labour-based taxes)
- Introduce charges for internalisation of social costliness of alternative land uses (e.g. erosion cost , pesticide accumulation internalisation)
- Install mechanisms that allow for all ranges of values to register with landholders, not only the most direct forms of use (e.g. land banking and compensated zoning schemes)

Interventions at the Conservancy Level
"Flow Monitoring"- monitoring the rate at which wildlife is being used consumptively.
"Stock Monitoring"-monitor the stock of wildlife periodically.

The privatisation of wildlife within Namibia has contributed to the significant increase in wildlife numbers and biomass (70% and 85% respectively) over the 20 year period between 1972 and 1992. There appears to have also been an increase of some 44% in the diversity of species. Therefore, the impact of privatisation in Namibia provides solid evidence of the incentives that this programme has created for the conservation of wildlife.

In Zimbabwe, a similar phenomenon to that in Namibia is occurring, with the expansion of wildlife use on private landholdings driven once again by the financial incentives for the use of wildlife rather than cattle. The contributions of the Conservancy movement at the national scale are not insignificant. The Save Valley Conservancy alone represents about 1% of the land area in Zimbabwe, and more importantly, it has increased the land dedicated to wildlife by 6%.

These findings illustrate that financial incentives are an important keystone for building a sound land use policy option, while the government has an important role in correcting obvious policy and market failures. It is important to note that the government plays an important role in the Conservancy movement providing the assurance of credible monitoring and enforcement structures within private joint management regimes. It requires the presence of a state-licensed guide on each conservancy hunt, enabling each conservancy member to monitor its partners' benefit taking. It further requires an annual state monitored stock taking excercise in order to audit the general performance of the conservancy.

The conservancy movement in southern Africa represents one of the most dynamic and hopeful trends in wildlife management currently taking place. Southern Africa is probably the only place on earth that is currently expanding the amount of habitat that is available to wildlife species on a significant scale. It is interesting that this movement is occurring in an area that has abandoned traditional wildlife management practices in favour of a market-based approach. Here, the forces for development are encouraging the adoption of more wildlife uses of land.

D. The Role of the International Institution: Monitoring and Certifying Habitat Use

1. Most of the conservation value of the sustainable use of a species is related to natural habitat, not the species in isolation. There is little conservation value from "captive breeding" of wildlife itself.

2. Certification should be used to induce investments in stocks of species in particular habitats, and hence "sustainability" should have, as its primary criterion, the maintenance of stocks in designated habitats.

3. Sustainable use must be based on some agreed indicator of stocks in the wild, by including: surveys, population analysis and flow analysis.

The Papua New Guinea Crocodile Case Study illustrates these points. In that country, and others, large crocodile farms have been established as a means of supplying the trade in reptile skins. There is little conservation value in the establishment of captive breeding operations, as it merely translates what was once wildlife into the domesticated sphere. The conservation value of wildlife use is in the creation of an instrument by which the investment in the retention of natural habitats may be compensated. Crocodile farms in PNG satisfy this criterion by means of their dependence on wild breeding stock; that is, the crocodile farms operate as "ranches" in the sense that they procure much of their required inputs (eggs, young crocodiles) from the wild.

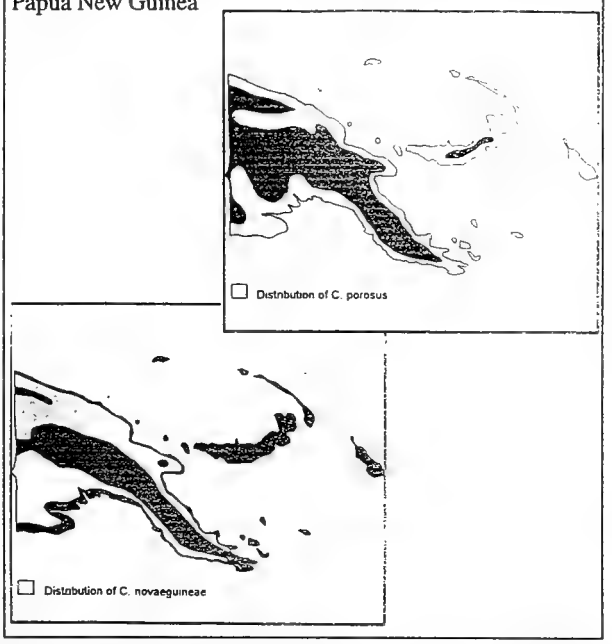
Incentives for sustainable use at the individual level may be induced by means of certification programmes that afford certified producers special access to markets; the crocodile is once again a good case study. Many of the populations of crocodile were initially listed on Appendix I of CITES on account of their endangerment, and this denied lucrative markets to most traders. Some populations of crocodile have been "downlisted" (allowed into trade) under exemptions granted for demonstrably sustainable ranching of wildlife. On account of this exemption, there is an incentive for the traders to demonstrate that their use is not harming crocodile populations, in order to keep their businesses intact. This incentive has resulted in the creation of a management programme to restrict the harvesting activities of individuals supplying them. Traders have even paid for the monitoring effort which certifies that stocks of crocodiles in the affected habitat remain relatively stable. These management activites are all induced by reason of the CITES certification mechanism which promises a market to those regimes which demonstrate management activities.

One of the most difficult facets of the certification process is the establishment of a criterion for sustainability that can be monitored. The first-best criterion is one which demonstrates that a management regime is able to set a stock target and then achieve it; second-best is a demonstration that populations do not decrease significantly. Such criteria need to be fully specified. Actual population trends are virtually impossible to measure for most species; in most cases, some sort of indicator must be substituted. In the case of PNG crocodiles, an aerial survey is conducted of nesting sites and, from this information; a rough trend regarding adult crocodile populations trends is obtained.

D. The Crocodile Industry in Papua New Guinea.

There are two species of crocodiles occurring in PNG, the endemic freshwater crocodile, *Crocodylus novaeguineae* and the saltwater crocodile, *Crocodylus porosus*. Their habitat extends through most of the lowlands of the main PNG landmass, and *C. porosus* is believed to be the only species in the offshore islands (see Map 4). Prior to European contact, in the areas where crocodiles were plentiful the native people hunted them for food, with the eggs and younger population most heavily used. Commercial shooting of crocodiles in PNG started in the mid 1950s, in particular, uncontrolled shooting of saltwater crocodiles from upwards of 150 cm in length, which over the period 1955-60 greatly reduced the adult population. This decline in saltwater crocodiles was soon followed by increased hunting of the less valuable freshwater crocodiles (see Figure 3).

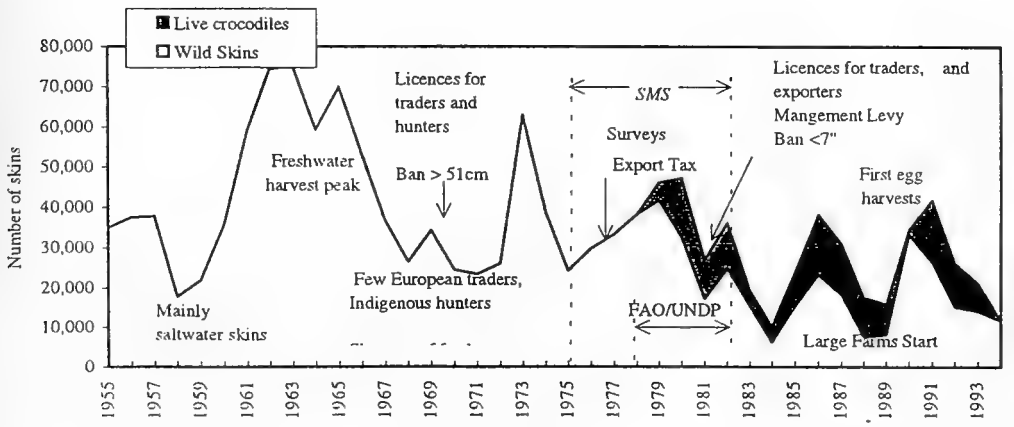
Map 4. Distribution of *C. porosus* and *C. novaeguineae* in Papua New Guinea



By the mid-1960s, the industry showed clear signs of over-exploitation of both crocodile species. Hunters targeted the remaining large breeding stock, greatly affecting the regeneration potential of the species. Besides, poor international marketing meant low prices throughout the industrial chain.

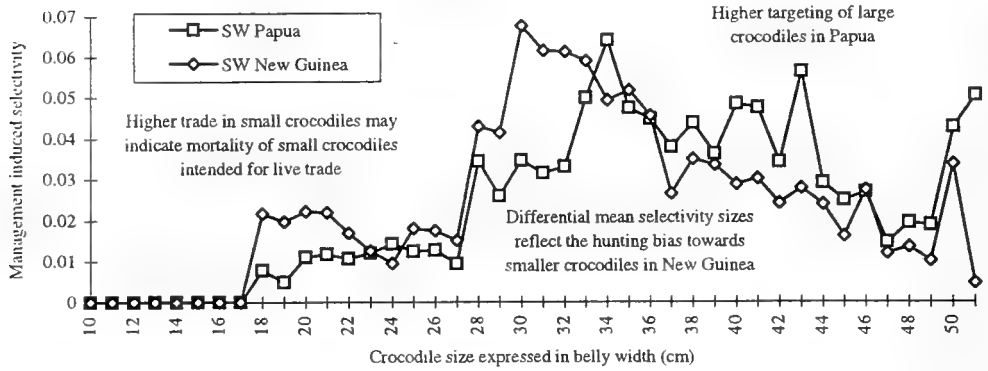
It was believed that effective direct control of the hunters would be impossible to achieve, given the extreme isolation of many rural communities. Instead, control over the intermediate stages of industry, traders and exporters, was expected to affect hunters' behaviour in a positive way. After the hunting peak of 1965-66, a management programme and legislation was introduced to maintain the crocodile populations and manage the skin trade. While other crocodile populations were listed in CITES Appendix I worldwide due to their endangerment, all crocodiles in PNG were retained in CITES Appendix II to allow for a managed trade. A licensing system for traders and exporters was introduced.

Figure 3 .Historical data on crocodile harvests in Papua New Guinea, 1955-1993.



Since then, the management system has allowed both the hunting of wild crocodiles and a thriving trade in live animals. The relatively high prices offered to hunters for live animals has resulted in a very active live trade (see Figure 3) and hunting effort appears to have been partially diverted from large crocodiles for the skin market to small live animals for the farms (see below and Figure 4). These findings indicate that the existence of an active trade in live animals is having a positive impact on the conservation of the species, reallocating hunting strategies and efforts.

Figure 4. Indicator of hunting effort for C. porosus. Higher the selectivity implies more effort is exerted on that cohort. Excludes live trade.



At present, crocodiles are hunted/trapped by individual village hunters with previous knowledge of prices and conditions, they then sell their live crocodiles and skins to registered traders. Traders, who are normally members of the community, are permitted to operate only within a certain area, which creates an incentive to maintain specific populations. This contrasts sharply with the unregulated market where itinerant traders have little conservation interest.

In order to improve the marketing conditions for hunters, the government established the Skin Marketing Service (SMS), to assist local hunters internally and the PNG industry externally. The first objective was accomplished by the creation of an alternative direct marketing source, the SMS, which would buy at better prices than intermediaries. This simplified and made more transparent the trade structure, in preparation for a private system taken over by licensed traders and company buyers. The SMS also suceeded in creating the necessary market power for PNG exports.

The need to maintain international certification has created incentives to monitor wild populations in order to demonstrate sustainability. Both large farms and the exporters of wild skins have a strong vested interest in the maintenance of the trade, which effectively means keeping the CITES Appendix II listing. In order to do that, monitoring mechanisms such as the aerial population surveys and the costs of issuing CITES permits have been financially supported by the industry. The interest of industry in the continuity of the monitoring and enforcement system is a positive outcome of use, with much needed support in times of financial difficulties for the government, although care must be taken to ensure the independence of the state's monitoring mechanism (see the Conservancy Case Study).

The CITES Appendix II ranching resolution has provided the certification mechanism required for the creation of incentives for the sustainable use of some other crocodile populations; however, the dissipation of rents at the international level, due to overproduction of crocodilian skins worldwide, indicates the need for international coordination of conservation/production operations to ensure adequate production levels to generate revenue for conservation. International institutions need to focus on both roles: certifying sustainability and generating rents.

E. The Role of the International Institution: Generating Appropriable Rents

1. The object of an international institution must be the generation of the maximum appropriable rents to those production systems which are certified as sustainable. Management must not simply allow trade or ban it.

2. The international institution should attempt to achieve the maximum rents for the certified producers by: a) determining a revenue maximising aggregate quota and allocating it between certified producers; and b) investing in the monitoring required to ensure exclusive purchasing from certified producers.

The *Vicuña* Case study illustrates these points. A simple ban on the use of *vicuña* initially provided the necessary management to reverse the decline of this species. However, as the species expanded to its carrying capacity, poaching resumed. One factor was the reluctance of local communities to share their lands with *vicuñas*, which were believed to compete with domestic livestock for grazing. The alternative for them was simply to replace them with domesticated species.

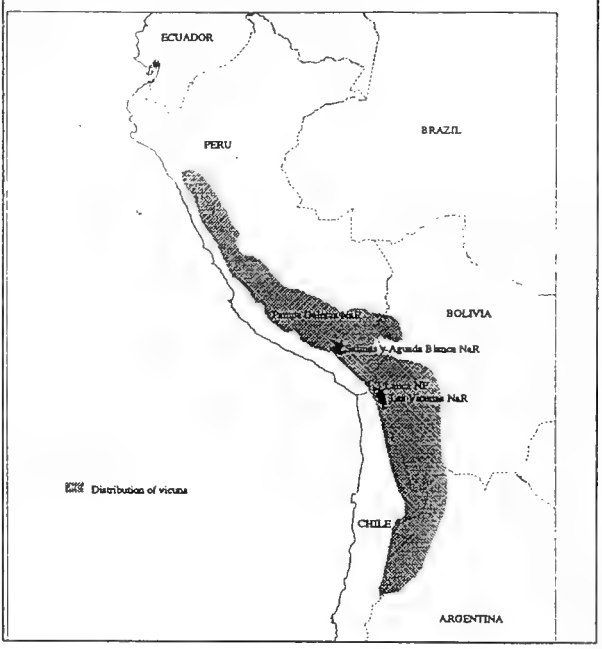
This pressure could be counterbalanced by some sort of management system that would cause *vicuña* production to be as lucrative as the alternative land use: llamas and alpacas. This could not be achieved simply by allowing the trade to resume in an unmanaged fashion; instead, a producers' cooperative was formed which allowed all products to flow through one channel. So long as consumers agree to exclusive purchase from this conduit (and enforce their agreement), the price of *vicuña* products can be controlled through restricted sales.

International institutions need to induce consumer states to agree to provide exclusive markets to those regimes which are certified as sustainable. This enables the certified producers to receive the greatest rents from their production, and hence have the greatest incentives to invest, provided they form cooperatives that determine aggregate production and allocate quotas. The price differential that results (between that afforded the certified cooperative and the uncertified suppliers) will be the rents that flow to sustainable management. This price differential will only be maintained to the extent that consumer states agree to provide exclusive markets, and then monitor and enforce this agreement.

E. Commercial Use of *Vicuña*

The vicuña (*Vicugna vicugna*) is one of the South American camelids along with the guanaco (*Lama guanicoe*), the llama (*Lama glama*) and the alpaca (*Lama pacos*). While vicuña and guanacos are wild, the llamas and alpacas are their domesticated counterpart, a process of selection that appears to have started between 7,000 and 6,000 years ago. The vicuña inhabits the Andean highlands, between 3,000 and 4,600 m. Its range currently extends over large areas of Perú (80,000), north of Argentina (23,000) and Chile (25,000), and west of Bolivia (12,000) (see Map 5).

Map 5. Distribution of *Vicugna vicugna*

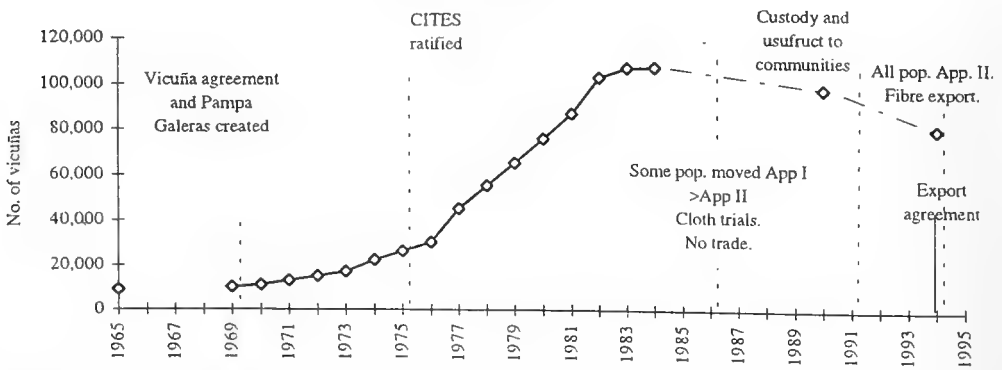


Hunted for their precious wool, which is the finest in the world, the vicuña was near to extinction by the late 1960s. With the European invasion, a trade in fibre was developed, involving the killing of the animal. The few attempts to regulate the use of vicuñas up to this century failed and uncontrolled hunting continued until the species reached near extinction, with just an estimated 10,000 individuals left in the 1950's.

Vicuña wool has been long praised for its softness and fineness. Its current scarcity also adds to the high prices commanded by the few items traded internationally. Vicuña wool (or rather fleece) is regarded as a luxury fibre along with Alpaca, Angora, Cashmere, Camel hair, Mohair, Musk Ox and, Yak, which are noted for their fineness, scarcity, unique appearance and status. It is a very exclusive market, with production of all luxury fibres representing less than 3% of annual sheepwool production by weight. Vicuña is considered the finest and rarest of all, and its softness and colour are highly valued, commanding the highest prices.

Conservation efforts to protect the vicuña started in Perú in 1969, with the creation of the Pampa Galeras National Reserve. Subsequently, range states have coordinated conservation efforts through several

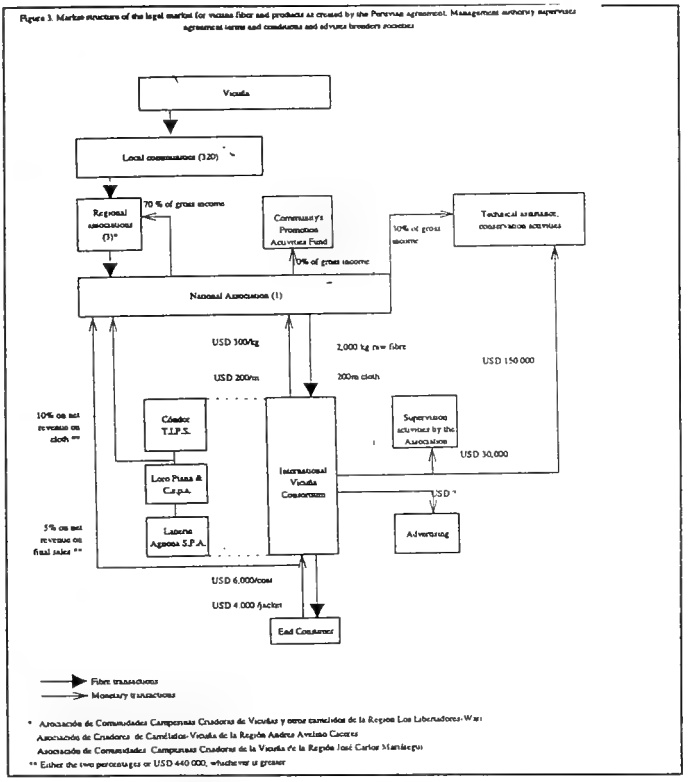
Figure 5. Total estimated vicuña population in Perú, 1965-1994.



agreements. In 1969 the first agreement for the protection of the *vicuña* was signed. Peru and Bolivia signed in 1969, with Argentina joining in 1971 and Chile in 1972. The agreement banned all international and internal

trade in vicuña products and prohibited the export of fertile individuals to third parties. The vicuña was also listed in Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in 1975, ratified by all range states and banning all international trade in the species.

These coordination efforts for conservation at the international level created a strong base for cooperation among range states. As a result, the *vicuña* experienced an impressive recovery during the last 30 years, particularly in Perú (see Figure 5). From an estimated 6,000 over the four range countries in 1965, the vicuña reached 10,000 by 1970, 101,215 in 1983 and around 154,000 by 1992. However, financial and physical requirements to effectively protect those areas has not grown at the same rate.



Studies in Chile suggest that the *vicuña* population has reached the carrying capacity of the habitat, given the existing livestock. At the regional level, some areas show significant overstocking, as in the Lauca National Park. As populations recovered, the competition over habitat with domestic livestock (llamas and alpacas) increased, being this one of the factors behind the increase in poaching. These factors made the involvement of the local communities essential for the long term protection of the species. One way to create incentives for conservation and protection of the vicuña at the local level was to reopen trade in *vicuña* wool, which can be extracted by shearing live *vicuñas* with little impact on wild populations, and generating revenue for local communities. This was the philosophy behind the second *vicuña* agreement in 1979.

In recent years, initiatives to reopen a legal trade in *vicuña* fibre have taken concrete form and Perú and Chile are already exporting/processing vicuña fibre for commercial purposes. In 1986, the trademark ``*Vicuñandes*'' was registered and some populations in Perú were downlisted to Appendix II in CITES to allow export of cloth made with fibre from live animals. In the last Conference of the Parties (Fort Lauderdale 1994) this was taken further and all Peruvian populations were downlisted to Appendix II. The downlisting was conditional on the trade in fibre from live vicuñas.

In Perú in 1991, legal reforms altered the status of the *vicuñas* in communal lands, returning them to the local communities in usufruct and custody, thus enabling their use under state regulation. Communal *Vicuña* Committees have been created since then as a means to protect, negotiate and regulate the use of the vicuña, complementing state protection. The National *Vicuña* Breeders' Society (NBS), encompassing all regional associations, is the legal body representing the communities.

Since *Vicuña* fibre is difficult to process given its fineness and relatively short staple length, the management authorities sought to create a joint venture with the industry. In order to get better prices, the NBS put out for tender the processing of the stock of fibre accumulated until 1993. A total of 2,000 tonnes of fibre and 200 metres of cloth from early trials were offered. The tender was for a two year participation agreement, requiring the applicant to guarantee a direct processing line to the final consumer.

The resulting agreement was very advantageous, and several funds for development and conservation were secured. The International *Vicuña* Consortium, the winning Italo-Peruvian venture, gained in exchange exclusive use for two years of the trademark and marketing of existing stocks of fibre. Figure 6 illustrates the various aspects of the agreement.

Revenues from the agreement will be channelled back to the communities through the National *Vicuña* Breeders' Society. At present, Perú's Rural communities are collecting fibre for the next tender which should take place in 1996.

F. The Need for a Sustainable Use Certification Protocol

1. The sustainable use certification should occur within the context of an international multilateral agreement.

2. A protocol to the Convention on Biological Diversity for the establishment of a sustainable use certification mechanism is necessary.

3. The mechanism should be extended to apply to the widest range of values possible, including non-use values.

As indicated in the case study on certification, there are at present a large number of formal and informal certification programmes. Many of these comply with many of the principles set forth above. Nevertheless, it is important that this plethora of programmes be replaced by a single multilateral mechanism for accomplishing these objectives. There are two primary reasons for doing so, both concerned with the establishment of the credibility of the certification mechanism.

First, the fundamental purpose of the establishment of such a mechanism is to allow consumers to convey the additional value that they attach to natural habitat back to producers who sustain it. The only task that must be accomplished in order to attain this object is the development of a *credible* mechanism for assuring consumers of this result. A legal obligation by the consumer state to monitor and enforce this mechanism, together with an international auditing mechanism to confirm this, is the highest form of assurance that may be achieved.

Secondly, sustainability must be assessed according to an agreed criterion, not a multitude of possible standards. An international authority would establish the international scientific committee required to agree consensus-based standards, and it could establish the international monitoring committee that would agree the basis for surveying with respect to those standards.

The development of a single multilateral agency to perform these tasks would eliminate the wasteful replication involved in the establishment of numerous unofficial bodies doing the same things. All that is required is a small multilateral agency composed of a scientific committee that establishes the criteria for sustainability and a monitoring committee that audits the performance of both consumer and producer states.

These tasks cannot be accomplished within the framework established under CITES. First, CITES is exclusively concerned with those species which are endangered or potentially threatened through commercial use; the required certification mechanism must be applicable to all the possible products from natural habitat utilisation, endangered or not. Secondly, the framework of CITES is directed to a very different purpose - the monitoring and halting of trade in endangered species; the object of a certification mechanism is to maximise the differential premium attainable from sustainable utilisation production methods.

Finally, it is important to recognise that there are many people who value wildlife for purposes other than use values, and that a multilateral agency could also harness these values and channel them back to the range states. In this case the agency would not certify the wildlife product as sustainable, but would instead certify the state's commitment to provide specific habitats or

conservation programmes as credible. In this way, individuals in consumer states could be assured that their donation would be channelled in the precise manner that the certification asserted. It is precisely the same certification process, only attached to a programme rather than a specific product.

F. Certification programmes for the sustainable use of forest products.

There has been an increasing trend towards the use of markets to enhance conservation incentives at the local level in developing countries. A significant ``green" market has evolved, with both traditional and new products reaching the marketplace. This growth of environmentally aware consumerism has led to a plethor of labels appearing in the market making doubtful claims about products as firms try to capture the ``green" premium from consumers. A study in 1991 by WWF UK found over 600 different timber firms making ecolabel claims for their wood products, of which only four were willing to substantiate their marketing claims.

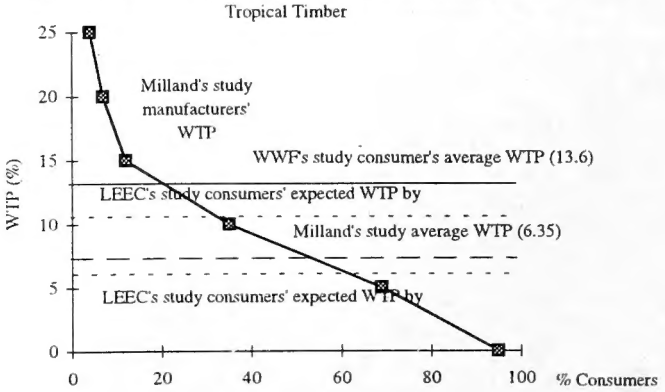
NGOs have also established their own formal or informal ``certification" programme. Informal ones have relied on the use of the NGO's reputation and use its emblem in the labels with some information on the product's characteristics. This has been the case in many non-timber products such as those from the Conservation International's Cultural Survival Enterprises, the Body Shop and Ben & Jerry's, who lack third party verification.

Formal certification schemes have been created through independent bodies with set criteria to assess the sustainability of forest management; among these are the Rainforest Alliance's ``Smart Wood" (US), Scientific Certification Services' ``Green Cross" (US), Soil Association's ``Woodmark" (UK) and the Societe General de Surveillance (Switzerland). Even governments, such as Indonesia, have taken measures aimed at identifying wood products from acceptable sources.

The consequences of this proliferation of labels has been confusion among consumers, who cannot link a label to sound conservation practices. A step forward in unifying all certification programme has been the creation in 1993 of the Forest Stewardship Council, an independent, non-profit, and non-governmental organization, aiming to provide consumers with reliable information about forest products and their sources. Involving representatives from governments, NGOs, indigenous peoples' organizations and forest industry, the FSC is seeking to accommodate the views of all stakeholders involved, acknowledging the need for wide support and recognition of it is to be credible. Previous global certification efforts by governments through organizations such as ITTO, where progress has been slow, have highlighted the limitations of a government approach ignoring the NGO and industry perspective.

The FSC is not a certifier of forest products, but its role is to accredit, evaluate and monitor certifiers of forest products. Through its principles, the FSC requires certifiers to assess a wide range of criteria, from land tenure to indigenous peoples' and community rights as well as environmental and monitoring standards. A major step of the FSC was the inclusion of both temperate and tropical forest products, hence involving a fairer commitment for both developed and developing countries.

Figure 7. UK surveys on the Willingness to Pay for Sustainably produced Tropical Timber



In order to allow for national provisions, the FSC is encouraging the creation of National Working Groups to draft country specific interpretations and expansion of the principles. This is necessary to allow differences in tropical and temperate areas and other social and political conditions. Despite the apparent difficulties in establishing unified criteria, the process was eased by the tacit harmonisation of existing criteria. Indeed, comparative studies of the various forest sustainability criteria used by various NGOs and governments have shown a high degree of similarity in their objectives.

Key to the creation of product differentiation was the issue of product discrimination by method of production, explicitly prohibited by GATT. For this reason, the approach has been to certify on a voluntary basis, with no legal restriction on imports; hence, the system must work purely on consumer preferences. With regard to differentiated access to certification services by operations in the developed and developing countries, measures are being taken, with some previous certification systems, such as Smart Wood, explicitly non-discriminating on the basis of cost.

The certification process promoted by FSC involves both forest management certification and product certification. The first involves the assessment of the viability of the operation at the grassroots level, while the product certification involves tracing the wood from source through the supply chain to the final products (chain-of-custody). While more expensive than alternative systems like country certification, this method allows for greater credibility of the label as well as a greater involvement of higher stages of industry in the certification process.

To date, 40 major retailers in the UK, representing 5% of the entire UK market for wood-based products, have publicly committed to buy FSC-accredited certified products by the end of 1995, a trade representing some USD 2 billion per year. In the US, 41 wood suppliers have been certified by a third party. At grassroots level, 19 forests have been certified, covering 4:26 million hectares and 1.2 million cubic metres per year. More than half of these are tropical forests.

The real test for this encouraging response from industry and NGOs will be the consumers' real willingness to pay for certified wood. Studies conducted to date show that consumers are expected to pay between 5% and 13.5%. However, retailing companies are still very much influenced in their buying decisions by price rather than environmental issues (see Figure 7).

The creation of exclusive marketing channels for the low volumes produced by ``sustainable harvesting'' projects has proven to be costly, with NGOs and government often subsidising the production of these projects at least during the pilot phase. It has been estimated that harvesting costs could almost double by the use of sustainable techniques. Additionally, certification costs are as yet uncertain but substantial. Governments and NGOs will have to play an active role in promoting the use of certified wood in order to create this price differential.

In addition to the capture of consumer willingness to pay for sustainably produced timber, the establishment of a credible ecolabel will also allow the use of other creative mechanisms to internalise the environmental externalities in the forests, such as tax or revenue transfers and trade subsidies. Such mechanisms could encompass wider resource values other than use.

Recommendation

It is the considered recommendation of this project team that the above principles be implemented by means of the adoption of a protocol to the Convention on Biological Diversity that would certify sustainable use regimes in the manner described above.

The object of the protocol would be the establishment of an agency for the following purposes:

a) the development and implementation of a set of agreed standards on the sustainable use of natural habitats;

b) the development and implementation of monitoring and auditing mechanisms that ensure that member states purchase exclusively those products that have been certified to meet these sustainable use standards.

These objects would be accomplished by the implementation of the following tasks:

a) the establishment of agreed criteria for sustainable use based upon stock level indicators in specified habitats;

b) the establishment of procedures for assessing the attainment of certain indicator levels in specified habitats as against specified criteria of sustainability;

c) the auditing of the performance of applicants for certification, and the continued auditing of the performance of existing certificants;

d) the auditing of the performance of consumer states in the execution of exclusive purchasing agreements; and

e) the provision of market information to certified producers regarding rent-maximising aggregate flows of particular wildlife products, and the monitoring of these flows.

In order to accomplish these tasks, the international agency would consist of:

a) a standards committee (for establishing general criteria for sustainability and the creation of regulations for each sub-agency);

b) a habitat monitoring sub-agency (responsible for implementing surveys of stock levels and testing for attainment of the criteria set for sustainability);

c) an international auditing sub-agency (responsible for annual and random auditing of the performance of producers and consumers in terms of flows between them); and

d) a market analysis sub-agency (responsible for providing rent maximisation analysis and advice to producers to aid and enhance their cooperation).

In order to reach these decisions, the standards committee would be:

a) a small representative body elected by the member states to the convention;

b) a democratic body rendering decisions and regulations by majority vote.